A mask having an auxiliary pattern is inspected. More specifically, the data representing the real pattern obtained by photographing the auxiliary pattern is compared with the data representing the design pattern, thereby to determine whether the pattern has defects or not.

Please replace the paragraph at page 2, line 18, to page 3, line 1, as follows:

Circuit patterns are made smaller and smaller as described above, and the resolution of the real pattern obtained by photographing of the circuit pattern is approaching the width of each element of the real pattern. In other words, the pattern precision is increasing. Thus, in a method in which differential is effected to detect the direction of a corner or an edge and real pattern data and design pattern data are compared, the position shift may occur between real pattern data and the design data. This inevitably lowers the accuracy of pattern inspection.

Please replace the paragraph at page 3, lines 3-6, as follows:

Accordingly, the object of the present invention is to provide a method and apparatus which can inspect a pattern with high accuracy without a position shift between real pattern data and design data.

Please replace the paragraph at page 14, line 21, to page 15, line 1, as follows:

To the real pattern memory 4 and design pattern memory 6, window extraction sections 7, 8 are connected respectively. To one window extraction section 7, a difference operation section 11 is connected via delay sections 9 and 10. To the other window extraction section 8, the difference operation section 11 is connected via a shift direction operation section 12 and a selection section 13.

Please replace the paragraph at page 19, lines 5-20, as follows:

In the step #3, the shift direction operation section 12 receives the design pattern data

Rij of the 7 x 7 window extracted by the window extraction section 8. The section 12

prepares design pattern data Qij of the total of 9 windows from the design pattern data Rij.

Of these nine windows, the first is a basic 5 x 5 window with a noticed pixel located in the

center. The other eight windows have been obtained by shifting the design pattern data of the

basic window by ½ pixel, in eight directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°,

respectively. The shift direction operation section 12 shifts the window by ½ pixel from the

sum ratio of adjacent pixels when the window of the design pattern data is shifted in the eight

directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°.

Please replace the paragraph at page 22, line 27, to page 23, line 12, as follows:

In the step #8, the repetitive execution section 15 determines whether the pattern

inspection for all pixels of the real pattern data Sij has been completed or not. If the section

15 determines that the inspection has not been completed, the flow proceeds to the step #9

and shifts a noticed pixel K by one pixel a shown in FIG. 7. Then, the flow returns to the step

#1, whereby the steps of inspecting the pattern of the object 2 are sequentially effected by the

shift direction operation means 12, selection section 13, difference operation section 11 and

defect judgement section 14, for all the pixels of the real pattern data.

Please replace the paragraph at page 25, line 26, to page 26, line 4, as follows:

And then, the mask pattern is formed by irradiating the Cr light shielding film formed

on the substrate with an electron beam (S2). Next, the inspection of the mask pattern is

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performed in accordance with above described inspection process (S3), and it is determined whether or not the mask pattern has a defect (S4).

Please replace the paragraph at page 26, lines 5-10, as follows:

In step 4, if it is determined that the mask pattern has a defect, the defect is recovered (S5) and the process of manufacturing the mask pattern is terminated (S6). Furthermore, in step 4, if it is determined that the mask pattern has no defect, the process is terminated (S6).

Please replace the paragraph at page 28, lines 20-26, as follows:

The window extraction section 7 has the function of extracting the inspection pattern data of a window of 5 x 5 pixels (5 x 5 window, hereinafter) with a noticed pixel in the center, for example, and supplying the data to the delay section 9 in order to carry out a local inspection of the inspection pattern data stored in the inspection pattern memory 131.

Please replace the paragraph at page 29, line 16, to page 30, line 1, as follows:

The shift direction operation section 12 has the function of receiving the non-defective pattern data of the 7 x 7 window extracted by the window extraction section 8. Based on the non-defective pattern data, the section 12 prepares non-defective pattern data of a nine 5 x 5 window. More precisely, it prepares a basic pattern data of a noticed pixel located in the center and pattern data of eight 5 x 5 windows, obtained by shifting the basic non-defective pattern data in eight directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°, for example, by a 1/2 pixel. The section 12 then finds the difference data between the non-defective pattern data and the inspection pattern data.

Please replace the paragraph at page 30, line 18, to page 31, line 1, as follows:

The difference operation section 11 finds the maximum value and the minimum value in the position of a noticed pixel when the standard image is shifted from the noticed pixel of the standard image and the surrounding pixels thereof. If the difference between the noticed pixel of the inspection image and the noticed pixel of the standard image is in the range between the maximum value found and the minimum value found, the difference operation section 11 determines that the difference is a noise, and does not output the difference.

Please replace the paragraph at page 31, lines 15-19, as follows:

The image device 1 uses a non-defective semiconductor wafer as an object, and inputs the image of the object such as a circuit pattern formed in the semiconductor wafer and outputs the image signal thereof.

Please replace the paragraph at page 31, line 24, to page 32, line 1, as follows:

Then, a general semiconductor chip, an object 2, is inspected. That is, the image device 1 inputs the image of a circuit pattern formed in the object 2 and so on, and outputs the image signal thereof. The image signal output by the image device 1 is converted by the A/D converter 3, to digital inspection pattern data. The inspection pattern data is stored into the inspection pattern memory 131.

Please replace the paragraph at page 32, lines 15-25, as follows:

Then, the image scanned by the image device 1 is converted by the A/D converter 3, to non-defective pattern data. The non-defective pattern data is input to the non-defective pattern memory 132. Thus, the image signal is stored in the non-defective pattern memory 132 as non-defective pattern data. The image of the object 2 is scanned by the image device 1, and is converted by the A/D converter 3, to inspection image data. The inspection image

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data is input to the inspection pattern memory 131 as an inspection image (S1).

Please replace the paragraph at page 35, lines 2-7, as follows:

If the difference is greater than the maximum value, the value obtained by the maximum value subtracted from the difference (S14) is output. And if the difference is smaller than the maximum value, it is determined whether the difference is smaller than the minimum value or not (S15).

Please replace the paragraph at page 35, lines 8-12, as follows:

If the difference is smaller than the minimum value, the value obtained by the minimum value subtracted from the difference (S16) is output. And if the difference is smaller than the minimum value, value "0" is output (S17).

Please replace the paragraph at page 38, lines 3-8, as follows:

An inspection table 223 on which an object 222 is put consists of an XY stage 224 and a θ stage 225 on the XY stage 224. With the inspection table 223, a loader 226 which carries a semiconductor wafer, which is the object 222, and an unloader 227 which delivers a semiconductor wafer are connected.

Please replace the paragraph at page 38, line 24, to page 39, line 6, as follows:

The device so constituted operates as follows: first, a semiconductor wafer, which is an object 222, is taken out of a magazine not shown and is carried by the loader 226, and put on the inspection table 223. As to the position shift of the semiconductor wafer on the inspection table 223, the rotation shift is corrected by the θ stage 225 and the center shift is corrected by the XY stage 224. And the fine alignment of the lens system is corrected by